



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
16.04.2003 Bulletin 2003/16

(51) Int Cl.7: **H03L 1/00**, H03L 7/099,
H03B 5/18

(43) Date of publication A2:
26.07.2000 Bulletin 2000/30

(21) Application number: **00100929.9**

(22) Date of filing: **18.01.2000**

(84) Designated Contracting States:
DE FR GB
Designated Extension States:
AL LT LV MK RO SI

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(30) Priority: **19.01.1999 JP 1060099**

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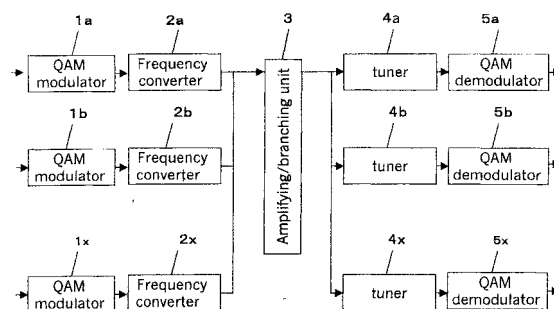
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(54) **Transmitting and receiving apparatus capable of the suppression of the microphonic noise in digital transmission system**

(57) A transmitting and receiving apparatus has: modulating circuit for modulating an input digital data; first frequency converting circuit for converting a signal output from said modulating circuit into a signal of a predetermined frequency; amplifying/branching circuit for amplifying and branching a signal output from said first frequency converting circuit; second frequency converting circuit for converting a signal output from said amplifying/branching circuit, into a signal of a predetermined frequency; and demodulating means for demodulating a digital data from a signal output from said second frequency converting circuit, wherein

each of said first and second frequency converting circuit comprises a PLL frequency synthesizer, said demodulating means has a carrier recovery section, and natural angular frequencies of said PLL frequency synthesizers are set to be equal to a maximum frequency of mechanical vibrations which are externally applied, or in a predetermined width above and below the maximum frequency, or a loop filter bandwidth of said carrier recovery section is set to be higher by a predetermined amount than the maximum frequency of mechanical vibrations which are externally applied.

Fig 1





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EUROPEAN SEARCH REPORT

Application Number
EP 00 10 0929

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| The present search report has been drawn up for all claims | | | |
| Place of search MUNICH | | Date of completion of the search 10 February 2003 | Examiner: Schinnerl, A |
| CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document | | | |

EPC FORM 1503 03 82 (P/04/01)



CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):

- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

- None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



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EUROPEAN SEARCH REPORT

Application Number
EP 00 10 0929

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
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| | | | TECHNICAL FIELDS SEARCHED (Int.Cl.7) |
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| The present search report has been drawn up for all claims | | | |
| Place of search MUNICH | | Date of completion of the search 10 February 2003 | Examiner Schinnerl, A |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>& : member of the same patent family, corresponding document</p> | | | |

EPO FORM 1503 03 02 (Pp.4/01)



The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-5

A transmitting and receiving apparatus wherein the natural angular frequencies of PLL frequency synthesizers or the loop filter bandwidth of the carrier recovery section are set according to the a maximum frequency of mechanical vibrations.

2. Claims: 6-11

Transmitting and receiving apparatus defined by details concerning the voltage controlled oscillator.

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 00 10 0929

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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10-02-2003

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82